Amendments to the Claims:

The following listing of the claims shall replace all previous versions and listing of the claims in this application.

Listing of Claims:

1.-23. (Cancelled)

24. (Currently Amended) A communication system comprising:

a first communication device including:

a digital signal source;

a quadrature amplitude modulation unit operatively coupled to the digital signal source;

a first pulse shaping filter operatively coupled to the quadrature amplitude modulation unit, wherein the first pulse shaping filter is such ~~being characterized in~~ that the frequency domain response meets the Nyquist criteria and that the square root of the frequency domain response has a first derivative that is continuous at all points, the pulse shaping filter having an impulse response corresponding to the square root of the frequency domain response;

a modulator operatively coupled to receive a signal from the pulse shaping filter; and

a transmitter operatively coupled to the modulator; and

a second communication device including

a receiver;

a demodulator operatively coupled to the receiver;

a second pulse shaping filter, the second pulse shaping filter being matched to the first pulse shaping filter and being such ~~characterized in~~ that the frequency domain response meets the Nyquist criteria and that the square root of the frequency domain response has a first derivative that is continuous at all points, the second pulse shaping filter having an impulse response corresponding to the square root of the frequency domain response;

a quadrature amplitude demodulation unit operatively coupled to the second pulse shaping filter; and

a signal output operatively coupled to the quadrature amplitude demodulation unit.

25. (Previously Presented) The communication system of claim 24 wherein the first communication device is a base unit and the second communication device is a terminal unit.

26. (Currently Amended) The communication system of claim 24 wherein the transmitter ~~broadcasts~~ is to broadcast signals at radio frequency.

27. (Previously Presented) The communication system of claim 24 wherein the frequency domain response NF(ω), is represented by the following equations:

$$NF(\omega) = T, \text{when } |\omega| \le \frac{\pi}{T}(1-\alpha)$$

$$NF(\omega) = \frac{T}{2}\left(1 - \sin\left\{\frac{\pi}{2}\sin\left[\frac{T}{2\alpha}\left(|\omega| - \frac{\pi}{T}\right)\right]\right\}\right), \text{when } \frac{\pi}{T}(1-\alpha) \le |\omega| \le \frac{\pi}{T}(1+\alpha)$$

$$NF(\omega) = 0, \text{when } \frac{\pi}{T}(1+\alpha) \le |\omega|,$$

wherein ω is frequency, T is a time period between symbols, and α is a roll-off factor.

28. (Currently Amended) The communication system of claim 24 wherein said digital signal source comprises an analog signal source operatively coupled to an analog-to-digital converter.

29. (Currently Amended) The communication system of claim 24 and further comprising:

an analog signal source; and

an analog-to-digital converter operatively coupled between the analog signal source and the quadrature amplitude modulation unit.

30. (Currently Amended) A digital communications receive unit comprising:

a signal receiving unit to receive a transmitted signal ~~source~~; and

a Nyquist filter operatively coupled to an output of the signal receiving unit ~~source~~, the filter having a characteristic of a square root of a Nyquist function in the frequency domain, the filter further being such ~~characterized in~~ that the square root of the frequency domain response has a first derivative that is continuous at all points,

wherein an output of said Nyquist filter is to be used to recover information contained in said transmitted signal.

31. (Currently Amended) The digital communications receive unit of claim 30 wherein the square root frequency domain response, $\sqrt{NF(\omega)}$, is represented by the following equations:

$$\sqrt{NF(\omega)} = \sqrt{T}, \text{when } |\omega| \le \frac{\pi}{T}(1-\alpha)$$

$$\sqrt{NF(\omega)} = \sqrt{\frac{T}{2}\left(1-\sin\left\{\frac{\pi}{2}\sin\left[\frac{T}{2\alpha}\left(|\omega|-\frac{\pi}{T}\right)\right]\right\}\right)}^{\frac{1}{2}}, \text{when } \frac{\pi}{T}(1-\alpha) \le |\omega| \le \frac{\pi}{T}(1+\alpha)$$

$$\sqrt{NF(\omega)} = 0, \text{when } \frac{\pi}{T}(1+\alpha) \le |\omega|,$$

wherein ω is frequency, T is a time period between symbols, and α is a roll-off factor.

32. (Currently Amended) The digital communications receive unit of claim 30 wherein the signal source comprises an analog-to-digital converter.

33. (Currently Amended) The digital communications receive unit of claim 30 wherein the signal receiving unit ~~source~~ comprises a demodulator ~~receiver~~.

34. (Currently Amended) ~~A digital signal processor~~ An integrated circuit comprising:

a memory device ~~storing~~ to store a look-up table for an impulse response for a filter, the filter having a characteristic of a square root of a Nyquist function in the frequency domain, the filter further being ~~characterized in~~ such that the square root of the frequency domain response has a first derivative that is continuous at all points; and

a digital signal processor operatively coupled to the memory device ~~core, wherein the memory device is integrated on the same integrated circuit as a digital signal processor core~~.

35. (Currently Amended) The ~~digital signal processor~~ integrated circuit of claim 34 wherein the square root frequency domain response, $\sqrt{NF(\omega)}$, is represented by the following equations:

$$\sqrt{NF(\omega)} = \sqrt{T}, \text{when } |\omega| \le \frac{\pi}{T}(1-\alpha)$$

$$\sqrt{NF(\omega)} = \sqrt{\frac{T}{2}\left(1-\sin\left\{\frac{\pi}{2}\sin\left[\frac{T}{2\alpha}\left(|\omega|-\frac{\pi}{T}\right)\right]\right\}\right)}^{\frac{1}{2}}, \text{when } \frac{\pi}{T}(1-\alpha) \le |\omega| \le \frac{\pi}{T}(1+\alpha)$$

$$\sqrt{NF(\omega)} = 0, \text{when } \frac{\pi}{T}(1+\alpha) \le |\omega|,$$

wherein ω is frequency, T is a time period between symbols, and α is a roll-off factor.

36. (New) A digital communications transmit unit comprising:

a signal source to provide an information-bearing signal; and

a Nyquist filter operatively coupled to an output of the signal source, the filter having a characteristic of a square root of a Nyquist function in the frequency domain, the filter further being such that the square root of the frequency domain response has a first derivative that is continuous at all points,

wherein an output of the Nyquist filter is to be provided for transmission over a communications channel.

37. (New) The digital communications transmit unit of claim 36 wherein the square root frequency domain response, $\sqrt{NF(\omega)}$, is represented by the following equations:

$$\sqrt{NF(\omega)} = \sqrt{T}, \text{when } |\omega| \le \frac{\pi}{T}(1-\alpha)$$

$$\sqrt{NF(\omega)} = \sqrt{\frac{T}{2}\left(1-\sin\left\{\frac{\pi}{2}\sin\left[\frac{T}{2\alpha}\left(|\omega|-\frac{\pi}{T}\right)\right]\right\}\right)}^{\frac{1}{2}}, \text{when } \frac{\pi}{T}(1-\alpha) \le |\omega| \le \frac{\pi}{T}(1+\alpha)$$

$$\sqrt{NF(\omega)} = 0, \text{when } \frac{\pi}{T}(1+\alpha) \le |\omega|,$$

wherein ω is frequency, T is a time period between symbols, and α is a roll-off factor.

38. (New) The digital communications transmit unit of claim 36 wherein the signal source comprises an analog-to-digital converter.

39. (New) The digital communications transmit unit of claim 36 wherein the signal source comprises a mapping unit.